



OXFORD LEARNING CENTRE
Advanced Level(Upper 6)

COMPUTER SCIENCE
PAPER 2

6023/2

MID YEAR PAPER 2

3 hours

Additional materials:

CD

TIME 3 hours

INFORMATION FOR CANDIDATES

This is a purely practical examination. All answers should be printed. Handwritten answers will **not** be marked.

This paper consists of **three** sections.

- Section A 20 marks
- Section B 50 marks
- Section C 30 marks

Answer **one** question from each section.

Each answer sheet should include the following information in the header section:

- Candidate Name and Candidate Number
- Centre Name and Date
- Subject Code

When answering programming questions, indicate the language used.

All work should be backed up by a soft copy on a CD. If a candidate prints on more than one sheet, fasten together with string. All answers should be correctly and clearly numbered.

This paper consists of 4 printed pages

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Section A

- 1 An alarm, Y, sends a signal ($Y = 1$) when certain fault conditions in a chemical process are detected. The inputs are:

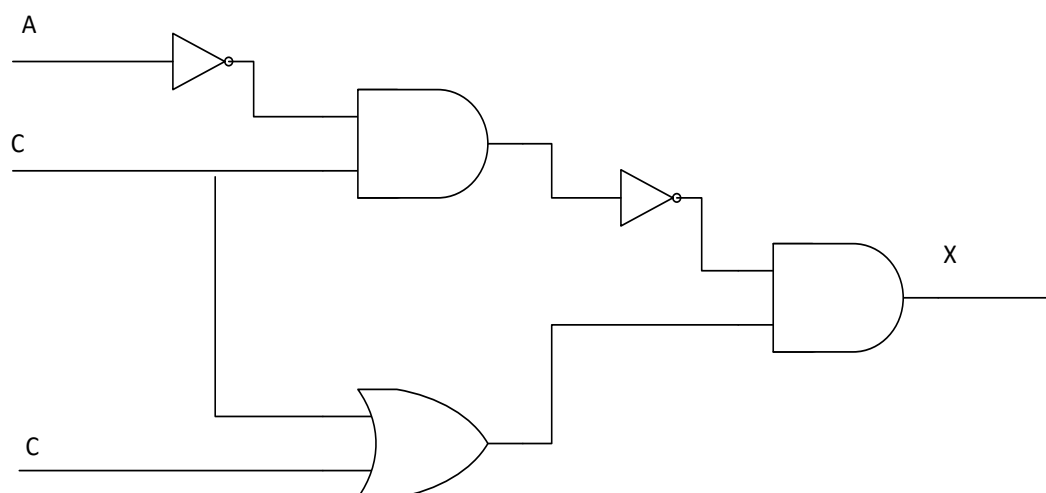
Input	Binary value	Condition
A	1	acidity > 5
	0	acidity $\leq$ 5
T	1	temperature $\geq$ 120°C
	0	temperature < 120°C
S	1	stirrer bar ON
	0	stirrer bar OFF

The alarm, Y, returns a value of 1 if:
 either temperature $\geq$ 120°C AND stirrer bar is OFF
 or acidity > 5 AND temperature < 120°C

(a) Draw a logic circuit to represent the above system. [6]

(b) Complete the truth table for this system. [8]

(c) Using a spreadsheet application program, or otherwise simulate the following logic circuit. Use only the following logic gates.



Section B

- 2 (a) A program is to be written to calculate the bonus for salesperson given at the year end. Bonus for a year is 500 and an extra bonus fee is given for a commission depending on the amount of the sales of the salesperson by year end. The bonus, the commission rate (CommissionRate) and Bonus (BonusPaid) is calculated as shown in the following pseudocode algorithm.

```

INPUT Purchase
IF Sales > 100 000 THEN
    CommissionRate = 0.01
ELSE IF Purchase > 50 000 THEN
    CommissionRate = 0.004
ELSE IF Purchase > 0 THEN
    CommissionRate = 0.001
ENDIF
BonusPaid = 500 + (Sales * CommissionRate)
OUTPUT BonusPaid

```

Write a program to calculate Bonus paid [30]

- (b) An array with 10 elements, called Staffnames, can store 10 names and could be visualized as this:

Index	Element
0	Fred
1	James
2	Tom
3	Robert
4	Jonah
5	Chris
6	Jon
7	Matthew
8	Mikey
9	Jack

Write a program code that will use a loop to create the array given above. [20]

Section C

- 3 (a) Using text editor or IDE environment, write SQL statements to perform the following;

(i) Create a table called "Property" with the following details: [6]

Property Table

BrochureID	Property	Bedrooms	Bathrooms	Garden	Garage	Price
A01	Apartment	2	2	No	Yes	\$750,000
A09	Apartment	2	1	No	No	\$100,000
B17	Bungalow	7	4	Yes	Yes	\$399,000
H10	House	4	2	Yes	No	\$95,000
H13	House	3	2	Yes	No	\$150,000
H23	House	3	1	No	Yes	\$250,000
H46	House	2	1	Yes	Yes	\$175,000

- (ii) Display the Property, Bedrooms, Bathrooms fields only of the Property whose Property type is and bedrooms are more than 2 [2]
- (iii) Delete an apartment whose Bronchure ID is H13 [2]

(b) A library plans to set up a database to keep track of its members, stock and loans. For members, the fields MemberID, Surname and Address are to be stored. For stock, the fields ISBN, AcquisitionNo, Title and Author are to be stored. For loans the MemberID of the borrowing the book, and the AcquisitionNo of the book are stored together with the date the book is due to be returned. When the book is returned the loan record is deleted

Draw an entity relationship diagram showing the relationships between the entities

[10]

- (c) The following is an un-normalised table named Delivery Note.

Delivery Note

Cust Numb	Cust Name	City	Country	Prod Numb	Prod Description
209	Peter	Mutare	Zim	19, 20, 21, 22	Bag, shoes, socks, Umbrella
198	Bruce	Gwanda	Zim	20, 21	Shoes, socks

- (i) Draw the 1NF of the above table. Underline Primary Key field(s). [4]
- (ii) Come up with the 2NF of the table you created, indicating Primary Key field(s). [6]